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THREE NEW WASPS FROM FLORIDA AND TAXONOMIC NOTES ON
ALLIED FORMS

(HYMENOPTERA, ACULEATA)

KARL V. KROMBEIN, *Entomology Research Division, ARS, U. S. Department of
Agriculture, Washington, D. C.*

This contribution describes three new subspecies, *Rygchium molestum boharti* and *Stenodynerus (S.) pulvinatus surrufus* in the Vespidae and *Trypoxylon (Trypargilum) tridentatum archboldi* in the Sphecidae, collected at the Archbold Biological Station, Lake Placid, Florida, and in other Floridian localities. Some taxonomic notes are presented also on the typical races of *Rygchium molestum* (Saussure), *Trypoxylon (Trypargilum) collinum* Smith, and *Trypoxylon (Trypargilum) johannis* Richards.

FAMILY VESPIDAE

*Rygchium molestum boharti*¹, new subspecies

(Figure 1)

Leionotus turpis (Saussure), Robertson, 1910. *Canad. Ent.* 42:325 (records styloped specimen from Inverness, Fla.)—Robertson, 1925. *Trans. St. Louis Acad. Sci.* 25:279 (records additional material from Inverness, Fla.) [MISIDENTIFICATION]

Rygchium molestum (Saussure) is a polytypic species ranging from Maryland south to Florida and west to Kansas, Oklahoma, and Texas. It may be distinguished at once from any of the other species of *Rygchium* occurring in the eastern United States by the moderately long (equaling the diameter of an ocellus), dense, erect vestiture on dorsum of head, thorax, and abdomen. Although the species is rare in collections, occasionally it may be reasonably abundant locally, as at Kill Devil Hills, North Carolina (Krombein coll.).

The Floridian race is known only from the few individuals listed below, mostly from peninsular Florida. Intergrades between the two races are known from several localities in the northern part of the

¹ Named for Dr. Richard M. Bohart in recognition of his valuable contributions to the taxonomy of the solitary vespids of North America.

range of *m. boharti*. *R. m. boharti* has the propodeum produced above into a pair of huge acute teeth (fig. 1), while in typical *molestum* the propodeum either is not produced at all or such development is limited to a pair of small, very low, blunt tubercles. Additional char-

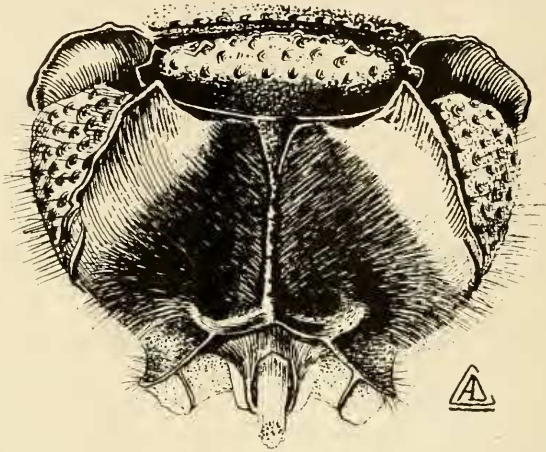


Fig. 1. *Rygchium molestum boharti*, allotype female; propodeum as viewed from behind and slightly above. Drawing by A. D. Cushman. 20 X.

acters separating the two are that *m. boharti* has rather extensive reddish markings on pronotum, propodeum, first abdominal segment and legs (red confined to legs in typical specimens of *m. molestum*) more strongly infumated wings, and the clear lemon yellow markings of typical *molestum* are replaced by a deeper yellow or orange.

Type. Male: Lake Placid, Highlands County, Florida; April 1, 1954 (K. V. Krombein; visiting avocado flowers) [U. S. National Museum, Type No. 64277, by transfer from author's collection].

Length 11 mm. (head to apex of second tergum 8.4 mm.), forewing including tegula 8.7 mm. Black, the following reddish: antennal scape above and next two segments, pronotal dorsum, tegula, propodeum except most of concavity and lower part of lateral surface, legs except coxae, trochanters and bases of femora in part, and disk of first tergum except apex; the following deep yellow to orange—mandible, clypeus, small spots on supraelypeal area and on front above antennae, line along inner eye margin, spot behind eye on vertex, spot on mesopleuron below tegula, small paired spots on scutellum, short band on postscutellum, narrow apical bands on first five terga and second sternum, those on first two terga broader than others. Vestiture and sculpture as in typical *molestum* except that propodeum above is produced into a pair of huge acute teeth. Wings more strongly infumated than in typical race.

Allotype. Female: Lake Placid, Fla.; April 4, 1953 (K. V. Krombein) [USNM].

Length 13.6 mm. (head to apex of second tergum 12.3 mm.), forewing including tegula 10.8 mm. Coloration as in type except that third to fifth terga lack apical bands, supraclypeal area and antenna except scape are dark. Sculpture and vestiture as in typical *molestum* except that propodeum above is produced into a pair of huge acute teeth (fig. 1). Wings more strongly infumated than in typical race.

Paratypes. Twenty-two males and two females as follows: Two males; Lake Placid; July 13, 1948 (R. H. Beamer). Two males; Cocoa, Brevard Co.; July 1944 (G. E. Bohart). One male; Orlando, Orange Co.; March 1944 (R. & G. Bohart). Nine males; Inverness, Citrus Co.; 1891, 1892 (C. Robertson nos. 10285, 10419, 10506, 10507, 10564, 12653, 12737, 12738, 12871). Two males; Daytona Beach, Volusia Co.; September 9, 1940 (H. T. Fernald). One male, one female; Welaka, Putnam Co.; April 18-20, 1955 and May 11-12, 1955 respectively (H. E. and M. A. Evans). Two males; Alachua Co.; April 15, 1955 (R. A. Morse; on flowers of *Melilotus alba*) and August 27, 1954 (H. V. Weems; on flowers of *Rhus glabra*). One male; St. Johns Co.; September 3, 1955 (H. V. Weems). One male; Orange Park, Clay Co.; March 25, 1952 (O. Peck). One female; Hilliard, Nassua Co.; August 19, 1930 (R. H. Beamer). One male; Suwanee Springs, Suwanee Co.; August 2-3, 1939 (R. H. Beamer). Paratypes are in the collections of the U. S. National Museum, American Museum of Natural History, Illinois Natural History Survey, University of Kansas, Florida State Plant Board, Division of Entomology (Ottawa, Canada), R. M. Bohart, H. E. Evans and the author. Male paratypes range in length (head to apex of second tergum) from 8.5 to 10.5 mm.; about half of them lack apical yellow bands on the third to fifth terga; three have a black blotch on middle of disk of first tergum; and one has some reddish markings on scutum and more extensive red markings on mesopleuron and propodeum. The female paratypes are 11.3-12.0 mm. from head to apex of second tergum; one agrees in coloration with the allotype, while the other has a black blotch on center of clypeus and middle of disk of first tergum.

Intergrades. Three females from Alachua Co. and Cedar Keys, Levy Co., and six males from Crescent City, Putnam Co., Orlando, Orange Co., and Tallahassee, Leon Co., are typical *molestum* with regard to the development of the propodeum; they have reduced areas of reddish integument on parts of pronotum, propodeum and first tergum. A similar slight suffusion with red occurs in some specimens of otherwise typical *molestum* at Kill Devil Hills, North Carolina, and at several localities in Georgia.

Biology. The specimens from Lake Placid were collected in the Highlands Ridge sand-scrub area of the Archbold Biological Station. At least the males appear to be attracted to nectar of various flowers. I assume that *m. boharti* probably nests in cavities in wood and preys on small lepidopterous larvae. Females of typical *molestum* will nest in borings in wooden traps at Kill Devil Hills and prey on small

lepidopterous larvae belonging to several species of Pyraustidae and Epipaschiidae. As in typical *molestum*, there are probably two generations a year judging from the dates of collection.

***Rygehium molestum molestum* (Saussure), new status**

Odynerus turpis Saussure, 1870. Rev. Mag. Zool. (2) 22: 60. ♀; Amer. bor.; type series in Geneva Museum.—Saussure, 1875. Smithson. Misc. Coll. 254: 281.
NEW SYNONYMY.

* *Odynerus molestus* Saussure, 1870. Rev. Mag. Zool. (2) 22: 61. ♂; Amer. bor.; type series in Geneva Museum.—Saussure, 1875. Smithson. Misc. Coll. 254: 290.

Odynerus manifestus Cresson, 1872. Trans. Amer. Ent. Soc. 4: 240. ♂, ♀; type in Academy of Natural Sciences of Philadelphia. Preoccupied.

Odynerus primus Dalla Torre, 1889. Wien. Ent. Ztg. 8: 125. New name.

Several years ago Dr. Jos. Bequaert suggested (*in litt.*) that *molestus* and *turpis* were opposite sexes of the same species, a possibility recognized by Saussure in 1875. Recently Dr. Ch. Ferrière of the Natural History Museum, Geneva, Switzerland, was kind enough to lend me the two available male syntypes of *molestus* and the two available female syntypes of *turpis*. These specimens are dirty and faded, and the two females have been attacked by museum pests. However, they are clearly conspecific, and agree with Bohart's and my interpretation of typical *Rygehium molestum*. Bohart and I have consistently used *molestum* for the taxon under discussion here, both in our identification work and in publications. I am exercising the first reviser's privilege and I am placing *turpis* as a synonym although it has page priority.

Lectotypes have not been designated previously for these two species and it seems desirable to take such action at this time. The two males of *molestus* bear the following labels: a small square of gold-coated paper; a label, "Etats Unis/Cn de Saussure."; and another label, "Odynerus/molestus Sss./Mus. Genève"; in addition, one of them bears a red label with the word "Typus" written on it (Dr. Ferrière does not know who placed this label on the specimen—it is not in Saussure's handwriting and does not constitute a valid lectotype designation). Both specimens agree with the original description except that one has apical yellow bands on the first five abdominal terga; the other has such bands on only the first four terga, as specified in the description. Therefore, I am selecting the latter specimen as lectotype and have so labeled it; it is the specimen which does not bear the red label, "Typus."

The two females of *turpis* bear the following labels: a small square of silver-coated paper; a label, "Etats Unis/Cn de Saussure."; and another label, "Odynerus/turpis Sauss./Mus. Genève." Both specimens agree with the original description. In one specimen the propodeum is scarcely produced above, and in the other the propodeum is produced above into a pair of low, blunt tubercles. I have selected

the former specimen as lectotype. It is evident that the description is based on both specimens for Saussure describes the metanotum (*i.e.*, the propodeum) as occasionally bearing a strong tooth above.

Saussure redescribed *molustus* and *turpis* in 1875, possibly based on the same material discussed above. He mentioned that the two males of *molustus* were from Tennessee, and that the two females of *turpis* were from Tennessee, sent by E. Fr. Falconnet.

In Florida typical *molustum* occurs in Santa Rosa County in western Florida, at Gainesville and Loehloosa in Alachua County, and Tallahassee in Leon County.

Stenodynerus (Stenodynerus) pulvinatus surrufus, new subspecies

This race differs from typical *pulvinatus* Bohart in the extensive reddish to orange markings, the somewhat coarser and closer punctation of head and thorax, darker wings, and the narrower apical reflex of second abdominal tergum. In Bohart's key to the red *Stenodynerus* of Florida (Fla. Entomologist 31: 71-74, 1948) *pulvinatus surrufus* runs to *beameri* Bohart, couplet 8. It may be separated readily from *beameri* by having very large, smooth interocellar tubercles, humeral angles not prominent, mid femur of male not flattened beneath, and base of second tergum with a transverse row of foveolae.

Typical *pulvinatus* ranges from Massachusetts south to northern Florida (Suwanee Springs in Suwanee County and Gold Head Branch State Park in Clay County) and west to Michigan, Kansas and Missouri. The new race is known only from Lake Placid and Levy County, Florida.

Type. Male: Lake Placid, Highlands County, Florida; July 16, 1957 (K. V. Krombein; reared at Washington, D. C. from nest M 287, cell 3 or 4) [U. S. National Museum, Type No. 64317].

Length 11 mm. (head to apex of second tergum 9 mm.), forewing including tegula 7.5 mm. Black, the following light reddish—scape, flagellum beneath except apically, V-shaped supra-antennal spot, large spot anterolaterally on pronotum, tegula, parategula, lateral blotch on dorsum of propodeum extending downward along the edge posteriorly, legs except coxae in part, first abdominal segment except declivous anterior aspect of tergum, middle of tergum above and apex narrowly, round anterolateral spot and narrow apical band on both second tergum and sternum; the following are orange—mandible except apex, clypeus, inner eye orbit to ocular sinus, spot behind eye above, round spot on mesopleuron above, postscutellum, and narrow band at apex of first tergum. Wings strongly infumated and with violaceous reflections. Punctation of head and thorax as in typical *pulvinatus* though correspondingly slightly coarser and closer; thin reflexed edge of second tergum only slightly wider than diameter of anterior ocellus.

Allotype. Female: Lake Placid, Fla.: July 16, 1957 (reared from nest M 287, cell 2) [USNM].

Length 13 mm. (head to apex of second tergum 11.5 mm.), forewing including tegula 9 mm. Markings as in type but clypeus black except base, flagellum black

except beneath at base, disk of first tergum without median black blotch, and fourth tergum with a very narrow orange band at apex. Wings colored as in type. Apex of second tergum scarcely reflexed.

Paratypes. Two males, Lake Placid, Fla. (K. V. Krombein); one male, July 14, 1957 (from nest M 286, cell 2); one male, July 16, 1957 (from nest M 287, cell 3 or 4). One female; Levy Co., Fla.; July 7, 1955 (R. A. Morse; on *Eriogonum tomentosum*). Paratypes are in the collections of the U. S. National Museum, American Museum of Natural History and the author. The male paratypes are a little smaller than the type, but are otherwise very similar except the one from nest M 286 was injured during the pupal state and the left mesopleuron is deformed and almost smooth, and the second tergum lacks the reflexed apex. The female paratype is a little smaller than the allotype, has the facial markings lemon yellow rather than orange, has the femora infuscated basally, and lacks the pair of anterolateral spots on second sternum.

Biology. The Lake Placid specimens were reared from two wooden traps containing 4.8 mm. borings which had been set out in the Highlands Ridge sand-scrub area of the Station in April 1957. The nests were provisioned with lepidopterous larvae by the mother wasp during June and were sent to me about June 24. When I opened them on July 1, there was a newly transformed wasp pupa in the second cell of nest M 286, and prepupae almost ready to transform to pupae in the second to fourth cells of nest M 287. The single male in M 286 left the nest on July 14, and the two males and one female in M 287 left the nest in that sequence on July 16.

The first cell in each nest contained a small bombyliid larva feeding on the wasp prepupa on July 1. These parasitic larvae completed feeding on July 5, transformed to pupae on July 9, and the adults emerged on July 22. Both were females of *Anthrax argyropyga* Wied. [det. W. W. Wirth].

FAMILY SPHECIDAE

*Trypoxylon (Trypargilum) tridentatum archboldi*², new subspecies

This race is known from a short series of specimens all but one of which was reared from wooden trap nests from Lake Placid, Florida. It is distinguished at once from typical *tridentatum* Packard by having the basal segments of antennae, pronotal disk and tubercle, legs and basal two abdominal segments reddish, the propodeum dorsally suffused to some extent with reddish, and the forewings entirely and deeply infuscate; in typical *tridentatum* the red is confined to the

² Named for Mr. Richard Archbold in recognition of his courtesy in making available the facilities of the Archbold Biological Station during several all-too-brief visits in 1953, 1954 and 1956, and of his continued interest manifested by sending me periodically the wooden trap nests from which this and many other species of wasps and bees have emerged. The information obtained from such nests has increased substantially our knowledge of the life history, prey preferences, and nesting habits of these insects.

two basal abdominal segments or is occasionally entirely lacking, and

the wings are very slightly infumated with somewhat darker apices. Typical *tridentatum* is known from Florida, but unfortunately only from a single specimen bearing the label "Fla".

Type. Female: Lake Placid, Highlands County, Florida; January 31, 1958 (K. V. Krombein; reared at Washington, D. C., from nest M 164, cell 3) [U. S. National Museum, Type No. 64278].

Length 13 mm., forewing including tegula 9 mm. Black, the following reddish: mandible except apical third, apex of clypens in middle, five basal antennal segments, pronotal disk and tubercle, tegula, propodeum suffused along the pair of low oblique ridges on dorsum, legs except extreme bases of coxae and first two abdominal segments except apex of second narrowly. Forewing strongly infuscated, the margin a little darker, and with coppery to violaceous reflections; hind wing not so infuscated but darker than in typical race. Suberect vestiture as dense as in typical race but yellowish to light tan instead of silvery to cinereous; fine, short appressed vestiture similar in both races. Sculpture identical in the two races.

Allotype. Male: Lake Placid, Fla.; February 25, 1958 (reared from nest M 124, cell 1) [USNM].

Length 13.5 mm., forewing including tegula 9.5 mm. Color and vestiture as in female; sculpture also similar, but as in male of typical race, somewhat coarser on propodeum; genitalia as in typical race.

Paratypes. Three females, one male; Lake Placid, Fla. (K. V. Krombein); one female, February 11, 1958 (from nest M 249, cell 2); one female, February 14, 1958 (from nest M 124, cell 5); one female, February 18, 1958 (from nest M 124, cell 4); one male, February 23, 1958 (from nest M 124, cell 3). One male, Lake Placid, Fla., July 13, 1948 (E. L. Todd). Paratypes are in the collections of the U. S. National Museum, American Museum of Natural History, and the author. Females range in length from 11 to 13 mm., males from 12 to 13.5 mm. There is very little variation in color in the reared series, but the July 13 male has the pronotum and first two abdominal segments entirely red and a large red patch on declivous surface of propodeum above abdominal insertion. The sculpture also is quite similar except for a little variation in development of the paired projections on propodeum and median frontal prominence; however, this is not as marked as the variation in these features in the typical race.

Biology. The nests from which the reared specimens emerged had been set out in the Highlands Ridge sand-scrub area of the Station. Details of the biology are reserved for publication in a separate contribution reporting the results from trap nest studies made in the Atlantic Coast States from New York to Florida. In brief, females of *tridentatum archboldi* can be induced to nest in a wooden block containing a boring 4.8 to 6.4 mm. in diameter. Presumably the wasp normally would nest in abandoned beetle borings in wood, deserted clay cells of *Sceliphron* and other wasps, or similar cavities. The mother places from 9 to 17 small, paralyzed spiders belonging to sev-

eral species of Araneidae and Theridiidae in the inner end of the boring and lays an egg on the abdomen of one of the last spiders brought in. Next she constructs a hard, non-friable partition 1.5 to 2.5 mm. in thickness from sand grains agglutinated probably with salivary secretion. Then she begins to provision a second cell adjacent to the first in the same manner, continuing thus until there is a linear series of cells ranging from 13 to 30 mm. in length (average length of 16 stored cells in three 6.4 mm. borings is 18 mm., and of 7 cells in one 4.8 mm. boring is 20 mm.).

Inhabitants of the nests sent to me were all in the prepupal state in cocoons when received in Washington; so I have no information on the earlier stages. However, the sequence is probably about as follows (based on observation of closely allied species): the egg hatches in from 1 to 2 days; the young larvae begins to feed by sucking fluids from the abdomen of the spider through a small puncture in the body wall; as the larva increases in size it feeds more voraciously, consuming the flesh as well as the body fluids; the store of spiders is entirely consumed in from 5 to 7 days; the larva then proceeds to spin a cocoon from silk secreted by the salivary glands.

The cocoon of *tridentatum archboldi* is identical in appearance to that of the typical race. It is cylindrical with rounded ends, from 4.6 to 6.0 mm. in diameter, and from 10 to 15 mm. in length. Grains of sand from the partition closing the cell are incorporated in the cocoon so that the very thin wall is extremely hard though brittle. Emergence from the cells is in reverse order, the inhabitant of the outermost cell emerging first and of the innermost cell last, as will be evident from the data given above for nest M 124. There appear to be two generations a year, the overwintering generation presumably emerging as adults during February and March and constructing nests from which the second generation emerges in June or July.

Related Species. Two other members of the subgenus *Trypargilum* occurring in Florida are superficially very similar to *tridentatum archboldi* in the extensive reddish markings. I have also reared both of them from borings in wooden trap nests from Lake Placid. These three forms may be separated by the following key:

Appressed vestiture on clypeus and lower half of front silvery with a slight yellowish cast; front with a strong median projection as broad as a posterior ocellus; hind ocellus separated from eye margin by about the diameter of the ocellus; scutum shining, punctures small and separated in middle of disk by more than the width of a puncture; metapleuron above with a narrow reflexed lamella; dorsum of propodeum with a depressed triangular area with transverse rugulae, the area bounded by rather well defined low ridges which usually terminate posteriorly in a pair of blunt tubercles or teeth; inner keel on dorsum of hind coxa weaker, evanescent opposite emargination for reception of trochanter; hind trochanter of male unarmed; larger, females 11-13 mm. long, males 12-13.5 mm.

..... ***tridentatum archboldi***, new subspecies

Appressed vestiture on clypeus and lower half of front silvery; front with a weaker median projection, narrower than a posterior ocellus; hind ocellus almost touching eye margin; scutum shining, punctures small and separated in middle by more than the width of a puncture; metapleuron not lamellate above; dorsum of propodeum flat, anteriorly with oblique rugulae, posteriorly with transverse ones; inner keel on dorsum of hind coxa weaker, evanescent opposite emargination for reception of trochanter; hind trochanter of male unarmed; smaller, females 9-12 mm. long, males 8-10 mm.

..... **collinum collinum** Smith

Dense appressed vestiture on clypeus and lower half of front golden; front with a weaker median projection, narrower than a posterior ocellus; hind ocellus separated from eye margin by more than half the diameter of the ocellus; scutum rather dull, the punctures coarser, subcontiguous in middle; metapleuron above with a wide reflexed lamella; dorsum of propodeum with a depressed triangular area, anteriorly with oblique rugulae, posteriorly with transverse ones, sides of depressed area not ridged; inner keel on dorsum of hind coxa complete to apex, higher opposite emargination for reception of trochanter; hind trochanter of male beneath with an acute subapical tooth on inner margin; larger, females 12-14.5 mm. long, males 10-13 mm.

..... **johannis** Richards

Trypoxylon (Trypargilum) collinum collinum Smith, new status

This was recognized as a discrete species by both Richards and Sandhouse in their recent revisions. I consider it as only subspecifically distinct from the wide-ranging *collinum rubrocinctum* Packard (new status). The chief differences are the darker wings, extensive reddish markings and slightly coarser propodeal sculpture of the Floridian race, and two minor differences in aedeagus and eighth sternum of the males. The cocoons of the two races are identical in shape and texture. I have no records of *collinum rubrocinctum* from Florida, and *c. collinum* is not known to occur north of the Okefenokee Swamp in southeastern Georgia.

Trypoxylon (Trypargilum) johannis Richards

This species is very closely related to the wide-ranging *clavatum* Say, and perhaps should be placed as a race of that species. However, the differences between *johannis* and *clavatum* in sculpture and in male genitalia are more numerous and of such a degree that it seems preferable to accord them specific rank. Furthermore, the cocoons of the two species exhibit constant though minor differences in shape and texture. It is not known whether there is a zone of overlap of these two species. I have seen one specimen of *clavatum* from Quincy, Florida, a part of the State from which I have no *johannis*. The only specimen of *johannis* from outside Florida bears only the label "Ga".